

Practical

be found in the publication of the Technical Committee CENELEC TC 31 entitled "Electrical apparatus for potentially explosive atmospheres General requirements" dated June 1997 and published by the CENELEC Central Secretariat, Rue de Stassart 35, B-1050 Brussels, Belgium. In addition, CENELEC also established EN 50016 to define the use of purged and pressurized equipment as a means of protection.

Please delete the Summary of the Invention in its entirety and insert in place thereof the following paragraphs (attached hereto is a marked version of these replacement paragraphs showing the changes made therein):

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The present invention is also a flow sensor for use in an instrument. The flow sensor has first and second differential pressure switches and a sealed chamber. The sealed chamber has an inlet and an outlet through which a fluid must flow in its entirety; a flow restrictor in the inlet and a flow restrictor in the outlet; and means for transferring the pressure in the sealed chamber to the first and second differential pressure switches.

The present invention is also a flow sensor for use in an instrument. The flow sensor has a sealed chamber. The sealed chamber has an inlet and an outlet through which a fluid must flow in its entirety; a flow restrictor in the inlet and a flow restrictor in the outlet; and means for transferring the

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pressure in the sealed chamber to first and second differential pressure switches.

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The present invention is also the combination of an instrument that has an enclosure having an opening through which a fluid can flow and a flow sensor. The flow sensor has first and second differential pressure switches; and a sealed chamber in the opening, with the chamber having an outlet. The sealed chamber has first and second restrictors through which the fluid must flow in its entirety; and means for transferring the pressure in the sealed chamber to the first and second differential pressure switches, the pressure in the enclosure to the first switch and the pressure at the sealed chamber outlet to the second switch.

The present invention is further an instrument that has an enclosure having an opening through which a fluid can flow. The instrument also has a first pressure transducer in the enclosure and a second pressure transducer outside of the enclosure. The instrument further has a sealed chamber in the opening and the chamber has an outlet. The sealed chamber has first and second flow restrictors through which the fluid must flow in its entirety. The chamber also has means for transferring the pressure in the sealed chamber to the first and second pressure transducers. The chamber further has means connected to the first and second pressure transducers for calculating for any given rate of flow of the fluid through the sealed chamber the flow through the outlet.

The present invention is a method for detecting the flow of a fluid through an enclosure having an outlet device through which the fluid can flow. The outlet device has a sealed chamber with first and second restrictors through which the fluid must flow in its entirety. The method transfers the pressure in the sealed chamber to first and second differential pressure switches; transfers the pressure in the enclosure to the first switch; and transfers the pressure outside of the enclosure to the second switch.

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The present invention is also a method for detecting a blockage in the outlet of a purged enclosure having an outlet monitoring device in the outlet. The outlet monitoring device has a sealed chamber with first and second restrictors through which a purging fluid must flow in its entirety. The method flows the purging fluid into the enclosure; monitors at a first differential pressure switch the difference in pressure between the pressure in the enclosure and the sealed chamber that results from the purging fluid flow through the first restrictor of the outlet device; monitors at a second differential pressure switch the difference in pressure between the sealed chamber pressure and the pressure outside of the enclosure that results from the purging fluid flow through the second restrictor of the outlet device; and determines that either the first or second restrictors are blocked when the second or the first switches, respectively, are open when the purging fluid flows.

Please delete the paragraph that starts at line 33 on page 4 of the application as filed and insert in place thereof the following (attached hereto is a marked version of this replacement paragraph showing the changes made therein):

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As is shown in the circuit diagram of Fig. 3 the two DPSs 26 and 28 are connected in the embodiment of the present invention shown in that figure in series. As can be appreciated the DPSs 26 and 28 may be connected in another configuration. If either DPS 26 or DPS 28 is open the series circuit is opened and the sensor 20 detects the lack of purge gas outlet flow from sensor 20.

Please delete the paragraph that starts at line 4 on page 5 of the application as filed and insert in place thereof the following (attached hereto is a marked version of this replacement paragraph showing the changes made therein):

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The sensor 20 ensures flow through the outlet of the

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enclosure 11 by utilizing a sealed chamber. If the sensor inlet restriction 22 is obstructed or blocked, the flow through the purge gas sensor 20 is reduced or eliminated. This reduces the pressure drop across the sensor outlet restriction 24 to a level that is below the actuation pressure of DPS 28. Since the two DPSs 26 and 28 are wired in series, the circuit opens and the lack of outlet flow is detected and thus sensor 20 meets the requirement of EN 50016 second edition as set forth in section 5.7 of that EN that the gas flow be monitored at the outlet of the enclosure 11.

Please delete the paragraph that starts at the bottom of page 5 of the application as filed and insert in place thereof the following (attached hereto is a marked version of this replacement paragraph showing the changes made therein):

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It should be appreciated that the restrictor pair 22, 24 also meets the requirement for a spark and [partial] particle barrier.

Please delete the paragraph that starts at line 2 of page 7 and the paragraph directly below the above paragraph that starts at line 15 of page 7 both of the application as filed and insert in place thereof the following (attached hereto is a marked version of this replacement paragraphs showing the changes made therein):

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It should be appreciated that the flow sensor of the present invention can be used to:

1. sense the presence of flow as long as the DPS actuation pressure is any value lower than the pressure differentials developed; and
2. sense the quantity of flow by either:
 - a) selecting the resistance to flow of the restrictors 22, 24 so that the pressure drop for a given flow rate matches the actuation pressure of the DPS 26,